Space Weather Forecast

Issued on Sunday 10 November 2024 at 01:21 Local

This forecast provides a four-day assessment of space weather events. The probabilities stated below are for reaching or exceeding the given levels. For more information about space weather impacts please see the Met Office Space Weather Scales https://www.metoffice.gov.uk/weather/learn-about/space-weather/uk-scales

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Space Weather Forecast Headline: Moderate solar activity is likely, with a slight chance of X-class flares.

Analysis of Space Weather Activity over past 24 hours

Solar Activity: Solar activity was Moderate during the period, with one Moderate flare recorded at 09/2050 UTC.

There are currently seven sunspot regions on the visible disc, with the southern portion of AR3886 now re-numbered as AR3890. There are two large and complex regions present. AR3889, in the southeast and AR3883 in the southwest. AR3886 approaching centre-disc, is a sparsely populated spot that consists of a number of small spots and pores and clusters of weaker spots extending across a large longitudinal and latitudinal area, with the newly numbered AR3890 to it's south. AR3879 continues as a large single mature spot in the northwest. The remaining spot regions are smaller and magnetically simple.

No Earth-directed CMEs (Coronal Mass Ejections) were observed.

Solar Wind / Geomagnetic Activity: Solar winds were indicative of ongoing CME and perhaps coronal hole high speed stream influences. Wind speeds varied between slightly elevated and background, around 360-450 km/s. The Interplanetary Magnetic Field (IMF), Bt, was generally Moderate, with peak values seen early in the period. The important north-south component, Bz, was mostly southward (negative) directed to start the period, at Weak to Moderate levels. Values became more variable and moderately positive towards the end of the period. Resultant Geomagnetic Activity was generally Unsettled to Active (Kp 3-4), with two G1 Minor Storm (Kp 5) intervals 0900-1500UTC.

Energetic Particles / Solar Radiation: The count rate of energetic particles (high energy protons) was at background levels through the period.

Four-Day Space Weather Forecast Summary

Solar Activity: Low to Moderate activity is forecast, with a likelihood of isolated Moderate class flares and a slight chance of Strong class flares, most probably from the complex sunspot in the east of the disk.

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Solar Wind / Geomagnetic Activity: No Earth-directed CMEs are currently forecast. Solar winds are currently experiencing ongoing CME and perhaps faster wind influences. Slightly Elevated solar wind speeds are considered most likely, around 400-450 km/s slowly easing on Day 1 (10 Nov). Further fast wind connection may occur Day 1 (10 Nov) until Day 2 (11 Nov), perhaps bringing Slightly Elevated to briefly Elevated speeds but this low confidence. Solar wind speeds expected to trend generally back towards background levels during Day 2 and 3 (11-12 Nov) in the absence of further enhancement. An increase in solar winds then likely into Day 4 (13 Nov) with an expected connection to a faster solar wind stream. This likely bringing Slightly Elevated to Elevated speeds to end the period.

Generally Quiet to Unsettled (Kp2-3) activity is forecast but with Active (Kp4) intervals likely and a slight chance of peak G1/Minor Storm conditions, between Days 1-3 (10-12 Nov) due to the risk of minor CME and fast wind influence. Unsettled to Active (Kp3-4) condition increasingly likely to end the period, with the chance of G1/Minor Storm conditions rising slightly.

Energetic Particles / Solar Radiation: The count rate of energetic particles (High energy protons) is at background levels. There is a rising slight chance of S1/Minor Proton Storms should we see any significant flares.

Geomagnetic Storms

Geomagnetic Storm Probability (Exceedance)	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Minor or Moderate	G1 to G2	Yes	20	15	10	20
Strong	G3	No	1	1	1	1
Severe	G4	No	1	1	1	1
Extreme	G5	No	1	1	1	1

Radio Blackouts - X-Ray Flares

X-Ray Flares Probability	Level	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	R1-R2 (M Class)	Yes	60	60	60	60
Very Active	R3-R5 (X Class)	No	10	10	10	10

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Solar Radiation Storms (High Energy Protons)

Radiation Storms Probability (Exceedance)	Level ($cm^{-2}sr^{-1}s^{-1}$)	Past 24 Hours (Yes/No)	Day 1 (00-24 UTC) (%)	Day 2 (00-24 UTC) (%)	Day 3 (00-24 UTC) (%)	Day 4 (00-24 UTC) (%)
Active	**≥ S1**	No	10	10	15	20
Very Active	**≥ S3 ***	No	1	1	1	1
* S3 ≥ 10 MeV ≥ 1000 pfu and/or 50 MeV ≥ 10pfu. (pfu = $cm^{-2}sr^{-1}s^{-1}$)						

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